NOVA Chemicals®

Material Safety Data Sheet

Material Name: NAPHTHA

MSDS ID: NOVA-0025

Section 1 - Product and Company Identification

Synonyms: Petroleum naphtha; Naphthenic naphthas; C_5, 210°C cut; Hydrocarbons, C_{4-12}, Aromatic-Containing
Chemical Name: Naphtha, (petroleum), arom.-contg.
Chemical Family: Hydrocarbon
Material Use: Feedstock for olefins, petrochemicals and gasoline blend streams
Chemical Formula: Not applicable, complex mixture

NOVA Chemicals
P.O. Box 2518, Station M
Calgary, Alberta, Canada T2P 5C6

Product Information: 1-412-490-4063
MSDS Information Email: msdsemail@novachem.com

EMERGENCY Telephone Numbers:
North America (Canada and US):
1-800-561-6682, 1-403-314-8767 (NOVA Chemicals)(24 hours)
1-800-424-9300 (CHEMTREC-USA)(24 hours)
1-613-996-6666 (Canutec-Canada)(24 hours)

Section 2 - Hazards Identification

HMIS Ratings: Health: 1* **Fire:** 4 **Physical Hazard:** 0 **Personal Protection:** chemical goggles, gloves, respirator, coveralls

*Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard*

NFPA Ratings: Health: 1 **Fire:** 4 **Reactivity:** 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

Emergency Overview

DANGER! EXTREMELY FLAMMABLE. This product is a clear, volatile liquid with a gasoline like odour and is insoluble in water. This product is harmful if it is inhaled, if it is swallowed or if liquid is aspirated into the lungs. Vapour is heavier than air and may spread long distances. Distant ignition and flashback are possible. Flammable liquid and vapour can accumulate static charge. Liquid can float on water and may travel to distant locations and/or spread fire. This product is irritating to the eyes and skin. Ingestion of this product or excessive inhalation may result in central nervous system effects including headache, dizziness, nausea, incoordination, and in confined spaces, unconsciousness and possible death. Some components are known to cause cancer.

Potential Health Effects: Eye

This product is irritating to the eyes.

Potential Health Effects: Skin

Prolonged and/or repeated skin contact with this product may severely dry and/or defat the skin, may cause irritation, dermatitis and possible chemical blistering. Product is not a skin sensitizer. Product contains components that may be absorbed through the skin.

Potential Health Effects: Ingestion

This product is harmful if swallowed. Ingestion can cause gastrointestinal irritation, nausea, vomiting, diarrhoea, central nervous system effects including headache, irregular heartbeats, nausea, sleepiness, dizziness, slurred speech and blurred vision. Ingestion may also cause liver and kidney damage. Product is an aspiration hazard; swallowing or vomiting of liquid may cause aspiration into the lungs. Liquid aspirated into the lungs may cause chemical pneumonitis.

Potential Health Effects: Inhalation

Excessive inhalation of this product causes headache, dizziness, nausea, loss of coordination, possible cardiac sensitization, and in extreme conditions coma and possibly death. Liquid aspirated into the lungs may cause chemical pneumonitis. Components of this product are considered carcinogenic. Based on animal testing, a component of this product (xylene) is considered to be a developmental toxicant in Canada (birth defects).

Section 3 - Composition/Information on Ingredients

CAS No.	Component	Percent by Wt.
68603-08-7	Naphtha (petroleum) arom.-contg.*	100
	The above listed CAS number and product is comprised of the following components:	
Mixture	Paraffins (C4-C12, Total)	60-70
Mixture	Naphthenes (C7-C10, Total)	7-12
Mixture	Aromatics (Total) **	8-10

Additional Information

* May be considered to be somewhat similar to Gasoline Blend Products (CAS # 8006-61-9).
** Aromatic components include toluene (1-3%)(CAS # 108-88-3), mixed xylenes (1-3%)(CAS # 1330-20-7), benzene (<1-2%)(CAS # 71-43-2), ethylbenzene (<1%)(CAS # 100-41-4) and naphthalene (<0.1-0.2%) (CAS # 91-20-3).

This product is hazardous under 29 CFR 1910.1200 (Hazard Communication).
This material is a controlled product under Canadian WHMIS regulations.
This product is regulated as a hazardous material / dangerous goods for transportation.

See Section 8 for applicable exposure limits. See Section 11 for applicable toxicity data.

Section 4 - First Aid Measures

First Aid: Eyes

Remove contact lenses, if it can be done safely. Immediately flush eyes with water for at least 15 minutes while holding eyelids open. Seek medical attention if symptoms develop or persist.

First Aid: Skin

Remove contaminated clothing and shoes. Wash immediately with soap and water. Apply moisturizers or other lotions. If product is injected under the skin, get medical attention immediately. Do not wait for symptoms (blistering) to develop. Obtain medical attention if extensive skin exposure has occurred and/or if irritation or pain persists. Completely decontaminate clothing, shoes and other protective equipment before reuse or discard.

First Aid: Inhalation

Move affected individual to non-contaminated air. Loosen tight clothing such as a collar, tie, belt or waistband to facilitate breathing. Seek immediate medical attention if the individual is not breathing, is unconscious or if any other symptoms persist. WARNING: Contact through mouth-to-mouth resuscitation may pose a secondary risk to the rescuer. Avoid mouth-to-mouth contact by using a mouth shield or guard to perform artificial respiration.

First Aid: Ingestion

DO NOT INDUCE VOMITING. Loosen tight clothing such as a collar, tie, belt or waistband. Seek immediate medical attention.

First Aid: Notes to Physician

For more detailed medical emergency support information call 1-800-561-6682 or 1-403-314-8767 (24 hours, NOVA Chemicals Emergency Response). Ensure thorough eye and skin decontamination. Treat unconsciousness, nausea, hypotension, seizures and cardiac arrhythmias in the conventional manner. Aspiration of this product during induced emesis can result in lung injury. If evacuation of stomach contents is considered necessary, use the method least likely to cause aspiration, such as gastric lavage after protecting the airway. Observe hospitalized patients for delayed chemical pneumonia, acute tubular necrosis, encephalopathy and dysrhythmias. Monitor for urinary phenol within 72 hours of acute exposure.

Section 5 - Fire Fighting Measures

See Section 9: Physical Properties for flammability limits, flash point and auto-ignition information.

General Fire Hazards

Fire and explosion hazards are serious when this product is exposed to heat or flame. Vapours are heavier than air and may travel along the ground to some distant source of ignition and flash back. If tank is involved in a fire, ISOLATE for 800 metres (1/2 mile) in all directions. Also, consider initial downwind evacuation for 800 metres (1/2 mile) in all directions.

Explosion Hazards

Vapours may form explosive mixture with air. Keep containers away from source of heat or fire. Containers may explode when involved in a fire. This product may be a static accumulator which can form an ignitable vapour-air mixture in a storage tank.

Hazardous Combustion Products

Upon combustion, this product emits carbon monoxide, carbon dioxide and/or low molecular weight hydrocarbons.

Extinguishing Media

Dry chemical, foam, carbon dioxide and water spray or fog. Use water to cool fire-exposed containers and to protect personnel. Water spray may be an ineffective extinguishing medium and may actually spread flames. Monitor water run-off for flammability and prevent entry into sewers, drains, ditches and waterways or other confined or underground spaces.

Fire Fighting Equipment/Instructions

Reference 2012 Emergency Response Guidebook, Guide No. 128. Position upwind. Keep unnecessary personnel away. Move containers from fire area if you can do so without risk. Fight fire from maximum distance or use unmanned holders or monitor nozzles. Immediately withdraw in case of fire and container venting or heat discoloration of a container. Fire fighters should wear full-face, self-contained breathing apparatus and thermal protective clothing. Avoid inhaling any smoke and combustion materials. Remove and clean or destroy any contaminated clothing. Cool containers with flooding quantities of water until well after the fire is out. Control runoff waters to prevent entry into sewers, drains, ditches, underground or confined spaces and waterways.

Section 6 - Accidental Release Measures

Evacuation Procedures

Isolate area. Keep unnecessary personnel away. Alert stand-by emergency and fire fighting personnel. Monitor surrounding area for buildup of flammable concentrations in air.

Small Spills

Eliminate ignition sources. Spill or leak area should be isolated. Stop discharge if safe to do so. Keep upwind and out of low areas. Contain discharge by booming on water or diking on ground. Remove liquid material with non-sparking approved pumps, skimmers or vacuum equipment. Absorb/adsorb residual materials and cleanup with non-sparking tools. Prevent entry into sewers, drains, ditches, underground or confined spaces, water intakes and waterways. Shovel material with non-sparking tools into appropriate container for disposal.

Large Spills

Consider initial downwind evacuation for 300 metres (1000 feet). Eliminate ignition sources. Stop discharge if safe to do so. Keep upwind and out of low areas. Contain discharge by booming on water or diking on ground. Spills on water will volatilize rapidly, making containment or recovery difficult. Remove liquid product with non-sparking approved pumps, skimmers or vacuum equipment. Absorb with DRY earth, sand or other non-combustible material. Prevent entry into sewers, drains, ditches, underground or confined spaces, water intakes and waterways. Soil remediation may be required.

Special Procedures

Contact local police/emergency services and appropriate emergency telephone numbers provided in Section 1. Ensure that statutory and regulatory reporting requirements in the applicable jurisdiction are met. Wear appropriate protective equipment and clothing during cleanup. Individuals without appropriate protective equipment should be excluded from area of spill until cleanup has been completed.

See Section 8 for recommended Personal Protective Equipment and see Section 13 for waste disposal considerations.

Section 7 - Handling and Storage

Handling Procedures

Keep locked up or secured. Handle in fully grounded, properly designed and approved equipment systems that are suitable for flammable liquids. Use with adequate ventilation. Do not ingest or inhale. Collect and flare vents. Keep away from heat and ignition sources. No smoking or open flames permitted in storage, use or handling areas. Dissipate static electricity during transfer by grounding and bonding containers and equipment. Bonding and grounding may be insufficient to eliminate the hazard from static-accumulating flammable liquids. For additional information on equipment bonding and grounding, refer to the American Petroleum Institute (API) Recommended Practice 2003, "Protection Against Ignitions Arising out of Static, Lightning, and Stray Currents" or National Fire Protection Association (NFPA) 77, "Recommended Practice on Static Electricity". Take special precautions when cold cutting or breaking into lines or when cleaning and disposing of empty containers.
Do not breathe gas, fumes, vapour or spray. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately. Avoid contact with skin and eyes. Keep away from incompatible materials such as oxidizing agents and acids. After handling, always wash hands thoroughly with soap and water.

Storage Procedures

Storage area should be clearly identified, well-illuminated, clear of obstruction and accessible only to trained and authorized personnel. Adequate security must be provided so that unauthorized personnel do not have access to product. Store in grounded, properly designed and approved vessels and away from incompatible materials. Store and use away from heat, sparks, open flame, or any other ignition source. Store according to applicable regulations for flammable materials for storage tanks, containers, piping, buildings, rooms, cabinets, allowable quantities and minimum storage distances. Use non-sparking ventilation systems, approved explosion-proof equipment and intrinsically safe electrical systems. Have appropriate extinguishing capability in storage area (e.g. sprinkler system, portable fire extinguishers (dry chemical, foam or carbon dioxide)) and flammable gas detectors. Keep absorbents for leaks and spills readily available. Consider use of external floating roof tanks or flame arrestors. Inspect vents during winter conditions for vapour ice buildup. Storage tanks should be above ground and diked to hold entire contents. A refrigerated room is generally recommended for warehouse storage of materials with a flash point lower than 37.8°C (100°F).

See Section 8: Exposure Controls/Personal Protection for appropriate Personal Protective Equipment. See Section 10 for information on Incompatibilities.

Section 8 - Exposure Controls / Personal Protection

Exposure Guidelines

A: General Product Information

Refer to published exposure limits - use effective control measures and PPE to maintain worker exposure to concentrations that are below these limits. Ensure that eyewash stations and safety showers are in close proximity to work locations.

B: Component Exposure Limits

ACGIH, OSHA, NIOSH, EPA, Alberta and Ontario exposure limit lists have been checked for components listed with CAS registry numbers. Other exposure limits may apply; check with authorities.

*NOTE: The Vacated OSHA Permissible Exposure Limits (PELs) are those provided in the 1989 update to OSHA's Air Contaminants Standard 29 CFR 1910.1000. These limits were vacated by the U.S. Court of Appeals, Eleventh Circuit buy may be enforceable in some states.

Toluene (108-88-3)

ACGIH:	20 ppm TWA; 75 mg/m3 TWA; BEI
OSHA (Vacated)*:	100 ppm TWA; 375 mg/m3 TWA; 150 ppm STEL; 560 mg/m3 STEL
OSHA Final:	200 ppm TWA; 300 ppm Ceiling
NIOSH:	100 ppm TWA; 375 mg/m3 TWA; 150 ppm STEL; 560 mg/m3 STEL 500 ppm IDLH
Alberta:	50 ppm TWA; 188 mg/m3 TWA Substance may be readily absorbed through intact skin
Ontario:	20 ppm TWA; BEI

Xylenes (1330-20-7)

ACGIH:	100 ppm TWA; 434 mg/m3 TWA; 150 ppm STEL; 651 mg/m3 STEL; BEI
OSHA (Vacated)*:	100 ppm TWA; 435 mg/m3 TWA150 ppm STEL; 655 mg/m3 STEL
OSHA Final:	100 ppm TWA; 435 mg/m3 TWA
NIOSH:	100 ppm TWA; 435 mg/m3 TWA; 150 ppm STEL; 655 mg/m3 STEL 900 ppm IDLH (related to m-xylene, or o-xylene or p-xylene)
Alberta:	100 ppm TWA; 434 mg/m3 TWA; 150 ppm STEL; 651 mg/m3 STEL
Ontario:	100 ppm TWA; 150 ppm STEL (as o-, m and p isomers); BEI

Benzene (71-43-2)

ACGIH:	0.5 ppm TWA; 1.6 mg/m3 TWA; 2.5 ppm STEL; 8 mg/m3 STEL; BEI Skin - potential significant contribution to overall exposure by the cutaneous route
OSHA (Vacated)*:	0.5 ppm Action Level; 1 ppm TWA; 5 ppm STEL (Cancer hazard, Flammable - see 29 CFR 1910.1028)
OSHA Final:	0.5 ppm Action Level; 1 ppm TWA; 5 ppm STEL (Cancer hazard, Flammable - see 29 CFR 1910.1028); 1 ppm TWA; 10 ppm TWA (applies to industry segments exempt from the benzene standard at 29 CFR 1910.1028); 5 ppm STEL (see 29 CFR 1910.1028); 25 ppm Ceiling (applies to industry segments exempt from the 1 ppm TWA and 5 ppm STEL of the benzene standard)
NIOSH:	0.1 ppm TWA; 1 ppm STEL 500 ppm IDLH
Alberta:	0.5 ppm TWA; 1.6 mg/m3 TWA; 2.5 ppm STEL; 8 mg/m3 STEL Substance may be readily absorbed through intact skin
Ontario:	0.5 ppm TWA; 2.5 ppm STEL; BEI Skin - Danger of cutaneous absorption

Ethylbenzene (100-41-4)

ACGIH:	20 ppm TWA; 87 mg/m3 TWA; 125 ppm STEL; 543 mg/m3 STEL; BEI
OSHA (Vacated)*:	100 ppm TWA; 435 mg/m3 TWA; 125 ppm STEL; 545 mg/m3 STEL
OSHA Final:	100 ppm TWA; 435 mg/m3 TWA
NIOSH:	100 ppm TWA; 435 mg/m3 TWA; 125 ppm STEL; 545 mg/m3 STEL 800 ppm IDLH (10% LEL)
Alberta:	100 ppm TWA; 434 mg/m3 TWA; 125 ppm STEL; 543 mg/m3 STEL
Ontario:	100 ppm TWA; 125 ppm STEL;BEI

Naphthalene (91-20-3)

ACGIH:	10 ppm TWA; 52 mg/m3 TWA; 15 ppm STEL; 79 mg/m3 STEL; BEI Skin - potential significant contribution to overall exposure by the cutaneous route
OSHA (Vacated)*:	10 ppm TWA; 50 mg/m3 TWA; 15 ppm STEL; 75 mg/m3 STEL
OSHA Final:	10 ppm TWA; 50 mg/m3 TWA
NIOSH:	10 ppm TWA; 50 mg/m3 TWA; 15 ppm STEL; 75 mg/m3 STEL 250 ppm IDLH
Alberta:	10 ppm TWA; 52 mg/m3 TWA; 15 ppm STEL; 79 mg/m3 STEL Substance may be readily absorbed through intact skin
Ontario:	10 ppm TWA; 15 ppm STEL Skin – Danger of cutaneous absorption

ENGINEERING CONTROLS

Engineering methods to reduce hazardous exposure are preferred controls. Methods include mechanical ventilation (dilution and local exhaust) process or personal enclosure, remote and automated operation, control of process conditions, leak detection and repair systems and other process modifications. Ensure all exhaust ventilation systems are discharged to outdoors, away from air intakes and ignition sources. Supply sufficient replacement air to make up for air removed by exhaust systems. Administrative (procedure) controls and use of personal protective equipment may also be required.

PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment: Eyes/Face

Wear safety glasses; chemical goggles are recommended if splashing is possible, or to prevent eye irritation from vapours.

Personal Protective Equipment: Skin/Hands/Feet

Use impervious gloves when handling product. Wear chemical-resistant safety footwear with good traction to prevent slipping. Work clothing that sufficiently prevents skin contact should be worn, such as coveralls and/or long sleeves and pants. Fire resistant (i.e., Nomex) or natural fibre clothing (i.e., cotton or wool) is recommended. Synthetic clothing can generate static electricity and is not recommended where a flammable vapour release may occur. Static Dissipative (SD) rated footwear is recommended.

Personal Protective Equipment: Respiratory

If engineering controls and ventilation are not sufficient to prevent buildup of aerosols or vapours, appropriate NIOSH approved air-purifying respirators or self-contained breathing apparatus (SCBA) appropriate for exposure potential should be used. Air-supplied breathing apparatus must be used when oxygen concentrations are low or if airborne concentrations exceed the limits of the air-purifying respirators.

Personal Protective Equipment: General

Personal protective equipment (PPE) should not be considered a long-term solution to exposure control. Employer programs to properly select, fit, maintain and train employees to use equipment must accompany PPE. Consult a competent industrial hygiene resource, the PPE manufacturer's recommendation, and/or applicable regulations to determine hazard potential and ensure adequate protection.

Section 9 - Physical & Chemical Properties

Physical State and Appearance:	Liquid, volatile	**Colour:**	Colourless
Odour:	Gasoline-like	**Odour Threshold:**	varies; <1 ppm (reported) (gasoline blends)
pH:	Not applicable	**Vapour Pressure:**	Range: 50 to 70 kPa (375 to 525 mm Hg) at 37.8°C (100°F)
Vapour Density at 0°C (Air=1):	3.3	**Boiling Point:**	Range: -12°C to 220°C (10°F to 428°F)
Freezing Point:	Not available	**Solubility (H2O):**	Negligible
Specific Gravity (Water=1):	0.71 at 20°C (68°F)	**Evaporation Rate (n-Butyl Acetate=1):**	2.9 at 20°C (68°F)
Percent Volatile:	100%	**Octanol/H2O Coeff.:**	Log Kow Range: 3 to 3.6
Auto Ignition:	227°C (441°F) (reported)	**Flash Point:**	<-2°C (-28°F); varies
Flash Point Method:	Estimated	**Upper Flammable Limit (UFL):**	7% (reported)
Lower Flammable Limit (LFL):	0.9% (reported)	**Flammability Classification:**	Extremely Flammable

Section 10 - Stability & Reactivity Information

Chemical Stability

This product is stable under normal use conditions for shock, vibration, pressure or temperature.

Chemical Stability: Conditions to Avoid

Fire and explosion hazards are serious when this product is exposed to heat or flame. Keep away from heat, sparks or open flame.

Incompatibility

This product may react with oxidizing agents.

Possibility of Hazardous Reactions or Hazardous Polymerization

Hazardous polymerization not likely to occur.

Corrosivity

Not corrosive to the common metals.

Hazardous Decomposition

Upon decomposition, this product emits carbon monoxide, carbon dioxide and/or low molecular weight hydrocarbons.

Section 11 - Toxicological Information

A: Acute Toxicity - General Product Information

Similar products were tested by the American Petroleum Institute (API) and submitted to the US EPA as the "Gasoline Blending Streams Test Plan" (201-14719A). Naphthas demonstrate consistently low acute toxicity by oral, dermal and inhalation exposure, are only mildly irritating to the eye, and mild to moderate skin irritants and are not skin sensitizers. Aspiration into the lungs may cause chemical pneumonitis. The following information has been found for its components:

Toluene - Contact can irritate the skin and eyes. Toluene can be absorbed through intact skin. Inhalation can irritate the nose and throat, causing coughing and wheezing. Inhalation may result in central nervous system (CNS) depression, causing trouble concentrating, headache, dizziness, nausea, loss of coordination, unconsciousness, and in extreme conditions, coma and possibly death. Ingestion and subsequent aspiration into the lungs may cause chemical pneumonitis.

Xylenes, mixed - Vapours can irritate the eyes. Contact with unprotected skin or eyes produces erythema and slight necrosis. Xylene can be absorbed through intact skin. Inhalation can irritate the nose and throat causing cough and difficulty breathing. Inhalation of high concentrations may result in central nervous system (CNS) depression, causing headache, dizziness, nausea, vomiting, loss of coordination, confusion, unconsciousness,

and in extreme conditions, coma and possibly death. Ingestion and subsequent aspiration into the lungs may cause chemical pneumonitis.

Benzene - May cause corneal injury to the eye. It is also a skin irritant that may be absorbed through the skin in harmful amounts. Inhalation of benzene can irritate the respiratory tract and may result in central nervous system (CNS) depression and possible death due to respiratory failure. Ingestion and subsequent aspiration into the lungs may cause chemical pneumonitis.

Ethylbenzene - Causes slight to moderate eye, nose, and throat irritation. Frequent dermal contact may lead to dryness of skin and dermatitis. Inhalation may result in central nervous system depression, causing headache, dizziness, nausea, loss of coordination, unconsciousness, and at high concentrations, difficulty breathing and possibly death. Ingestion and subsequent aspiration into the lungs may cause chemical pneumonitis.

Naphthalene - Can irritate the skin, eyes, nose and throat. Contact may cause corneal damage. Inhalation of high concentrations may result in central nervous system (CNS) depression, causing headache, fatigue, confusion, nausea, vomiting and unconsciousness. Ingestion can cause nausea, vomiting, diarrhoea, liver damage, kidney damage and haemolytic anemia which may lead to methemoglobinemia.

B: Acute Toxicity - LD50/LC50

Naphthas (68603-08-7)
Oral LD50 Rat: >5000 mg/kg; Dermal LD50 Rabbit: >2000 mg/kg; Inhalation LC50 Rat: >5.2mg/l, 4hr exposure
Toluene (108-88-3)
Inhalation LC50 Rat: 12.5 mg/L/4H; Inhalation LC50 Rat: >26,700 ppm/1H; Oral LD50 Rat: 636 mg/kg; Dermal LD50 Rabbit: 8390 mg/kg; Dermal LD50 Rat: 12,124 mg/kg
Xylenes (1330-20-7)
Inhalation LC50 Rat: 5000 ppm/4H; Inhalation LC50 Rat: 47,635 mg/L/4H; Oral LD50 Rat: 4300 mg/kg; Dermal LD50 Rabbit: >1700 mg/kg
Benzene (71-43-2)
Inhalation LC50 Rat: 13,050-14,380 ppm/4H; Oral LD50 Rat: 1800 mg/kg
Ethylbenzene (100-41-4)
Inhalation LC50 Rat: 17.2 mg/L/4H; Oral LD50 Rat: 3500 mg/kg; Dermal LD50 Rabbit: 15,354 mg/kg
Naphthalene (91-20-3)
Inhalation LC50 Rat: >340 mg/m3/1H; Oral LD50 Rat: 490 mg/kg; Dermal LD50 Rat: >2500 mg/kg; Dermal LD50 Rabbit: >20 g/kg

C: Chronic Toxicity - General Product Information

Similar products were tested by the American Petroleum Institute (API) and submitted to the US EPA as the "Gasoline Blending Streams Test Plan" (201-14719A). Repeated dermal exposure to naphthas can show skin irritation with the only systemic effects related to skin damage and accompanying stress. When administered by inhalation, minimal toxic effects are demonstrated in kidneys of male rats; a species and sex specific syndrome not relevant to human health. Product is not genotoxic and does not cause significant reproductive or developmental effects. The following information has been found for its components:

Toluene - Prolonged and repeated contact may cause defatting dermatitis with drying and cracking, itching, and a skin rash. Repeated toluene exposure has been associated with central nervous system effects, loss of appetite, enlargement of the liver, kidney effects, blood effects as well as cardiac effects. The chronic neurotoxic effects on the central nervous system may progress to an irreversible state. Intentional misuse of toluene has resulted in reproductive effects including physical and developmental abnormalities such as low birth weight and microencephaly and has been referred to as "Fetal Toluene Syndrome".

Xylenes, mixed - Prolonged and repeated skin contact can cause defatting dermatitis with drying and cracking. Chronic inhalation has been associated with central nervous system effects, loss of appetite, nausea, ringing in the ears, irritability, thirst, anemia, mucosal bleeding, enlarged liver and hyperplasia. Xylene can damage the liver and kidneys. In chronic occupational exposure, xylene (usually mixed with other solvents) has produced irreversible damage to the central nervous system and may be ototoxic (damages hearing or increases sensitivity to noise), probably from a neurotoxic mechanism. Xylene is classified as a developmental toxicant in Canada.

Benzene - Prolonged and/or repeated exposure can cause drying and scaling of the skin. Long-term exposure has been associated with certain types of leukemia in humans. Prolonged exposure of an aging population of workers to benzene can cause myelodysplastic syndrome (MDS) (abnormal growth of red, white or platelet stem cells in the bone marrow). IARC and OSHA consider benzene to be a human carcinogen. EPA has classified benzene as a Group A, known human carcinogen. Chronic exposure to benzene has been reported to cause bone marrow abnormalities and adverse blood effects including anemia. Progressive deterioration of hematopoietic function expressed as a decrease in absolute lymphocyte count is the most sensitive indicator of benzene exposure. Benzene may cause fetotoxicity and teratogenicity. Chromosomal aberrations have been noted in animal tests.

Ethylbenzene - Prolonged and repeated exposure may be harmful to the central nervous system (CNS), upper respiratory tract and/or may cause liver disorders. It may also cause drying, scaling and blistering of the skin. Ethylbenzene has been classified by IARC as Group 2B (possibly carcinogenic to humans) based on the National Toxicology Program's two year study of very high exposure levels on rats and mice (NTP, 1999).

Naphthalene - Prolonged and repeated exposure can cause cataracts and allergic skin reactions. If allergy develops, very low future exposure can cause itching and a skin rash. Chronic exposure may result in jaundice, optical neuritis, aplastic anemia, liver damage, kidney damage and haemolytic anemia which may lead to methemoglobinemia. Naphthalene has been shown to cause nasal and lung cancer in animal tests and has been classified by IARC as Group 2B (possibly carcinogenic to humans). NTP has listed naphthalene as "Reasonably Anticipated to be a Carcinogen". Naphthalene was not mutagenic in the Ames Salmonella microsome assay.

D. Chronic Toxicity - Carcinogenic Effects

ACGIH, EPA, IARC, OSHA, and NTP carcinogen lists have been checked for those components with CAS registry numbers.

Toluene (108-88-3)

ACGIH: A4 - Not Classifiable as a Human Carcinogen
EPA: Classification: under the Guidelines for Carcinogen Risk Assessment (U.S. EPA, 2005), there is inadequate information to assess the carcinogenic potential of toluene.
IARC: Monograph 71 [1999]; Monograph 47 [1989] (Group 3 (not classifiable))

Xylenes (1330-20-7)

ACGIH: A4 - Not Classifiable as a Human Carcinogen
EPA: Classification: not classified as a carcinogen.
IARC: Monograph 71 [1999]; Monograph 47 [1989] (Group 3 (not classifiable))

Benzene (71-43-2)

ACGIH: A1 - Confirmed Human Carcinogen
EPA: Classification: known human carcinogen for all routes of exposure.
IARC: Monograph 100F [2012]; Supplement 7 [1987]; Monograph 29 [1982] (Group 1 (carcinogenic to humans))
OSHA: 0.5 ppm Action Level; 1 ppm TWA; 5 ppm STEL (Cancer hazard, Flammable - see 29 CFR 1910.1028)
NTP: Known Human Carcinogen

Ethylbenzene (100-41-4)

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans
EPA: Classification: not classifiable as to human carcinogenicity.
IARC: Monograph 77 [2000] (Group 2B (possibly carcinogenic to humans))

Naphthalene (91-20-3)

ACGIH: A4 - Not Classifiable as a Human Carcinogen
EPA: Classification: possible human carcinogen.
IARC: Monograph 82 [2002] (Group 2B (possibly carcinogenic to humans))
NTP: Reasonably Anticipated To Be A Human Carcinogen

Section 12 - Ecological Information

Ecotoxicity

A: General Product Information

Similar products were tested by the American Petroleum Institute (API) and submitted to the US EPA as the "Gasoline Blending Streams Test Plan" (201-14719A). Product is volatile and biodegradable. It is not soluble in natural waters. Product has low to moderate absorption into soil and sediment. Spills or releases from containment may result in direct impacts to water, soil or sediment quality. Some components may be hazardous to aquatic life. The degree of aquatic toxicity (fish, invertebrate and algal) generally ranges from approximately 1mg/l to 200 mg/l.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

Toluene (108-88-3)

Test & Species	Results and Conditions
96 Hr LC50 Pimephales promelas	15.22-19.05 mg/L [flow-through] 1 day old, 12.6 mg/L [static]
96 Hr LC50 Oncorhynchus mykiss	5.89-7.81 mg/L [flow-through], 14.1-17.16 mg/L [static], 5.8 mg/L [semi-static]
96 Hr LC50 Lepomis macrochirus	11.0-15.0 mg/L [static]
96 Hr LC50 Oryzias latipes	54 mg/L [static]
96 Hr LC50 Poecilia reticulata	28.2 mg/L [semi-static], 50.87-70.34 mg/L [static]
96 Hr EC50 Pseudokirchneriella subcapitata	>433 mg/L
72 Hr EC50 Pseudokirchneriella subcapitata	12.5 mg/L [static]
48 Hr EC50 Daphnia magna	5.46 - 9.83 mg/L [static], 11.5 mg/L

Xylenes (1330-20-7)

Test & Species	Results and Conditions
96 Hr LC50 Pimephales promelas	13.4 mg/L [flow-through], 23.53-29.97 mg/L [static]
96 Hr LC50 Oncorhynchus mykiss	2.661-4.093 mg/L [static], 13.5-17.3 mg/L
96 Hr LC50 Lepomis macrochirus	13.1-16.5 mg/L [flow-through], 19 mg/L, 7.711-9.591 mg/L [static]
96 Hr LC50 Cyprinus carpio	780 mg/L [semi-static], >780 mg/L
96 Hr LC50 Poecilia reticulata	30.26-40.75 mg/L [static]
48 Hr EC50 water flea	3.82 mg/L
48 Hr LC50 Gammarus lacustris	0.6 mg/L

Benzene (71-43-2)

Test & Species	Results and Conditions
96 Hr LC50 Pimephales promelas	10.7-14.7 mg/L [flow-through], 22,330-41,160 µg/L [static]
96 Hr LC50 Oncorhynchus mykiss	5.3 mg/L [flow-through]
96 Hr LC50 Lepomis macrochirus	22.49 mg/L [static], 70,000-142,000 µg/L [static]
96 Hr LC50 Poecilia reticulata	28.6 mg/L [static]
72 Hr EC50 Pseudokirchneriella subcapitata	29 mg/L
48 Hr EC50 Daphnia magna	8.76-15.6 mg/L [static], 10 mg/L

Ethylbenzene (100-41-4)

Test & Species	Results and Conditions
72 Hr EC50 Pseudokirchneriella subcapitata	4.6 mg/L, 2.6-11.3 mg/L [static]
96 Hr EC50 Pseudokirchneriella subcapitata	>438 mg/L, 1.7-7.6 mg/L [static]
48 Hr EC50 Daphnia magna	1.8-2.4 mg/L

Naphthalene (91-20-3)

Test & Species	Results and Conditions
96 Hr LC50 Pimephales promelas	5.74-6.44 mg/L [flow-through], 1.99 mg/L [static], 6.14 mg/L [flow-through], 6.08 mg/L [flow-through]
96 Hr LC50 Oncorhynchus mykiss	1.6 mg/L [flow-through] juvenile, 0.91-2.82 mg/L [static]
96 Hr LC50 Lepomis macrochirus	31.0265 mg/L [static]
72 Hr EC50 Skeletonema costatum	0.4 mg/L
48 Hr LC50 Daphnia magna	2.16 mg/L,
48 Hr EC50 Daphnia magna	1.96 mg/L [flow-through], 1.09-3.4 mg/L [static]

Environmental Fate/Mobility

This product will volatilize into air rapidly from surface water or soils. It is estimated to have moderate ability to move through soils, into ground waters.

Persistence/Degradability

Similar products are volatile and biodegradable as demonstrated by testing and modeling. Components are likely to degrade in air and over time in soils or ground water into less toxic materials.

Bioaccumulation/Accumulation

This product has a reported Kow range of 3 to 3.6 and is not known to bioconcentrate in fish, animals or plants.

Section 13 - Disposal Considerations

U.S./Canadian Waste Information

A: General Product Information

This product is known to be a hazardous waste according to US and Canadian regulations. The use, mixing or processing of this product may alter its properties or hazards. Contact federal, provincial/state and local authorities in order to generate or ship a waste material associated with this product to ensure materials are

handled appropriately and meet all criteria for disposal of hazardous waste. DO NOT ATTEMPT TO DISPOSE OF BY UNCONTROLLED IGNITION. Since emptied containers retain product residue, follow safe handling/label warnings even after container is emptied.

See Section 7: Handling and Storage and Section 8: Exposure Controls/Personal Protection for additional handling information that may be applicable for safe handling and the protection of employees.

Waste generator is advised to carefully consider hazardous properties and control measures needed for other materials that may be found in the waste.

B: Component Waste Numbers

Toluene (108-88-3)
RCRA: waste number U220

Xylenes (1330-20-7)
RCRA: waste number U239 (Ignitable waste, Toxic waste)

Benzene (71-43-2)
RCRA: waste number U019 (Ignitable waste, Toxic waste); 0.5 mg/L regulatory level

Naphthalene (91-20-3)
RCRA: waste number U165

Section 14 - Transportation Information

US DOT Information

Shipping Name: Petroleum distillates, n.o.s. (Naphtha)
UN/NA #: UN1268 **Hazard Class:** 3 **Packing Group:** I
Required Label(s): FLAMMABLE LIQUID
Additional Info.: The Reportable Quantity (RQ) for benzene is 10 lbs (4.54 kg), for mixed xylenes and naphthalene is 100 lbs (45.4 kg) and for toluene and ethylbenzene is 1000 lbs (454 kg).
2012 Emergency Response Guidebook, Guide No. 128

Canadian TDG Information

Shipping Name: PETROLEUM DISTILLATES, N.O.S. (Naphtha)
UN #: UN1268 **Hazard Class:** 3 **Packing Group:** I
Required Label(s): FLAMMABLE LIQUID
Additional Info.: 2012 Emergency Response Guidebook, Guide No.128

International Air Transport Association (IATA) and International Civil Aviation Organization (ICAO) Information

Shipping Name: Petroleum distillates, n.o.s. (Naphtha)
UN #: UN1268 **Hazard Class:** 3 **Packing Group:** I
Required Label(s): FLAMMABLE LIQUID

International Maritime Dangerous Goods (IMDG) Code

Shipping Name: PETROLEUM DISTILLATES, N.O.S. (Naphtha)
UN #: UN1268 **Hazard Class:** 3 **Packing Group:** I
Required Label(s): FLAMMABLE LIQUID
Additional Info.: EmS No.: F-E, S-E
Marine Pollutant: No

Section 15 - Regulatory Information

A: International Regulations

Component Analysis - International Inventory Status

Component	CAS No.	US - TSCA	EU - EINECS	CANADA - DSL
Naphtha (petroleum) arom.-contg.*	68603-08-7	Yes	Yes	Yes
Toluene	108-88-3	Yes	Yes	Yes
Benzene	71-43-2	Yes	Yes	Yes
Xylenes	1330-20-7	Yes	Yes	Yes
Ethyl benzene	100-41-4	Yes	Yes	Yes
Naphthalene	91-20-3	Yes	Yes	Yes

B: USA Federal & State Regulations

Ongoing occupational hygiene, medical surveillance programs, site emission or spill reporting may be required by federal or state regulations. Check for applicable regulations.

USA OSHA Hazard Communication Class

This product is hazardous under 29 CFR 1910.1200 (Hazard Communication). HCS Classes:
HCS CLASS: DANGEROUS MAY CAUSE CANCER
HCS CLASS: Flammable liquid having a flash point lower than 22.8°C (73°F) and a boiling point lower than 37.8°C (100°F).
HCS CLASS: Irritant
HCS CLASS: Target organ effects.

B: USA Right-to-Know – Federal

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

Toluene (108-88-3)
SARA 313: 1.0 % de minimis concentration
CERCLA: 1000 lb final RQ; 454 kg final RQ

Xylenes (1330-20-7)
SARA 313: 1.0 % de minimis concentration
CERCLA: 100 lb final RQ; 45.4 kg final RQ

Benzene (71-43-2)
SARA 313: 0.1 % de minimis concentration
CERCLA: 10 lb final RQ

Ethylbenzene (100-41-4)
SARA 313: 0.1 % de minimis concentration
CERCLA: 1000 lb final RQ; 454 kg final RQ

Naphthalene (91-20-3)
SARA 313: 0.1 % de minimis concentration
CERCLA: 100 lb final RQ; 45.4 kg final RQ

USA Right-to-Know - State

The following components appear on one or more of the following state hazardous substance lists. Some components (including those present only in trace quantities, and therefore not listed in this document) may be included on the Right-To-Know lists of other U.S. states. The reader is therefore cautioned to contact his or her NOVA Chemicals' representative or NOVA Chemicals' Product Integrity group for further U.S. State Right-To-Know information.

Component	CAS #	NJ	PA
Toluene	108-88-3	Yes	Yes
Xylenes	1330-20-7	Yes	Yes
Benzene	71-43-2	Yes	Yes
Ethylbenzene	100-41-4	Yes	Yes
Naphthalene	91-20-3	Yes	Yes

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):
WARNING! This product contains a chemical known to the state of California to cause cancer.
WARNING! This product contains a chemical known to the state of California to cause reproductive/ developmental effects.

C: Canadian Regulations - Federal and Provincial

Canadian Environmental Protection Act (CEPA): All components of this product are on the Domestic Substances List (DSL) or are exempt and are acceptable for use under the provisions of CEPA.

Ingredient Disclosure List (IDL)

The following components are identified under the Canadian Hazardous Products Act - Ingredient Disclosure List (IDL):

Component	CAS #	Minimum Concentration
Toluene	108-88-3	1 %
Xylenes	1330-20-7	1% (related to m-, o-xylene); 0.1% (related to p-xylene)
Benzene	71-43-2	0.1 %
Ethylbenzene	100-41-4	0.1 %
Naphthalene	91-20-3	1 %

WHMIS Classification

Workplace Hazardous Materials Information System (WHMIS): This product has been classified in accordance with the hazard criteria of the CPR (Controlled Products Regulations) and the MSDS contains all the information required by the CPR.
WHMIS CLASS B2: Flammable liquid with a flashpoint lower than 37.8°C (100°F).
WHMIS CLASS D2A: Carcinogen (Benzene, Ethylbenzene, Naphthalene), Animal embryotoxin (Xylene)
WHMIS CLASS D2B: Toxic (Skin/eye irritant)

Other Regulations

Ongoing occupational hygiene, medical surveillance programs, site emission or spill reporting may be required by federal or provincial regulations. Check for applicable regulations.

Section 16 - Other Information

Label Information

DANGER! EXTREMELY FLAMMABLE. This product is a clear, volatile liquid with a gasoline like odour and is insoluble in water. This product is harmful by inhalation, if it is swallowed or if liquid is aspirated into the lungs. Vapour is heavier than air and may spread long distances. Distant ignition and flashback are possible. Flammable liquid and vapour can accumulate static charge. Liquid can float on water and may travel to distant locations and/or spread fire. This product is irritating to the eyes and skin. Ingestion of this product or excessive inhalation may result in central nervous system effects including headache, dizziness, nausea and incoordination, and in confined spaces, unconsciousness and possible death. Some minor components are known to cause cancer.
FIRST AID:
SKIN: Remove contaminated clothing and shoes. Wash immediately with soap and water. Apply moisturizers or other lotions. If product is injected under the skin, get medical attention immediately. Do not wait for symptoms (blistering) to develop. Obtain medical attention if extensive skin exposure has occurred and/or if irritation or pain persists. Completely decontaminate clothing, shoes and other protective equipment before reuse or discard.
EYES: Remove contact lenses, if it can be done safely. Immediately flush eyes with water for at least 15 minutes, while holding eyelids open. Seek medical if symptoms develop or persist.
INHALATION: Move affected individual to non-contaminated air. Loosen tight clothing such as a collar, tie, belt or waistband to facilitate breathing. Seek immediate medical attention if the individual is not breathing, is unconscious or if any other symptoms persist. WARNING: Contact through mouth-to-mouth resuscitation may pose a secondary risk to the rescuer. Avoid mouth-to-mouth contact by using a mouth shield or guard to perform artificial respiration.
INGESTION: DO NOT INDUCE VOMITING. Loosen tight clothing such as a collar, tie, belt or waistband. Seek immediate medical attention.
IN CASE OF A LARGE SPILL: Consider downwind evacuation for 300 metres (1000 feet). Eliminate ignition sources. Stop discharge if safe to do so. Keep upwind and out of low areas. Contain discharge by booming on water or diking on ground. Spills on water will volatilize rapidly, making containment or recovery difficult. Remove liquid product with non-sparking approved pumps, skimmers or vacuum equipment. Absorb with DRY earth, sand or other non-combustible material. Prevent entry into sewers, drains, ditches, underground or confined spaces, water intakes and waterways. Soil remediation may be required.

References

Available on request.

Special Considerations

Bonding and grounding may be insufficient to eliminate the hazard from static-accumulating flammable liquids For additional information on equipment bonding and grounding, refer to the American Petroleum Institute (API) Recommended Practice 2003, "Protection Against Ignitions Arising out of Static, Lightning, and Stray Currents" or National Fire Protection Association (NFPA) 77, "Recommended Practice on Static Electricity".

Key/Legend

ACGIH = American Conference of Governmental Industrial Hygienists; ADR = Transport of Dangerous Goods by Road; ADR/RID = European Agreement of Dangerous Goods by Road/Rail; BOD = Biochemical Oxygen Demand; CAS = Chemical Abstracts Service; CEPA = Canadian Environmental Protection Act; CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; CFR = Code of Federal Regulations; CPR = Controlled Products Regulations; DFG = Deutsche Forschungsgemeinschaft; DOT = Department of Transportation; DSL = Domestic Substances List; EC50 = Effective Concentration 50%; EEC = European Economic Community; EINECS = European Inventory of Existing Commercial Chemical Substances; ELINCS = European List of Notified Chemical Substances; EPA = Environmental Protection Agency; EU = European Union; FDA = Food and Drug Administration; GHS = Globally Harmonized System for the Classification and Labelling of Chemicals; HCS = Hazard Communication Standard; HMIS = Hazardous Materials Identification System; IARC = International Agency for Research on Cancer; IATA = International Air Transport Association; ICAO = International Civil Aviation Organization; IDL = Ingredient

Disclosure List; IDLH = Immediately Dangerous to Life or Health; IMDG = International Maritime Dangerous Goods; IMO = International Maritime Organization; ISHL = Industrial Safety and Health Law; Kow = Octanol/water partition coefficient; LC50 = Lethal Concentration 50%; LD50 = Lethal Dose 50%; LEL = Lower Explosive Limit; LFL = Lower Flammable Limit; LLV = Level Limit Ceiling Limit (Sweden dust); MAK = Maximum Concentration Value in the Workplace; MITI = Ministry of International Trade and Industry; MSDS = Material Safety Data Sheet; NAB = Threshold Values (Indonesia); NCEC = National Chemical Emergency Centre; NDSL = Non-Domestic Substances List; NFPA = National Fire Protection Association; NIOSH = National Institute for Occupational Safety and Health; NJTSR = New Jersey Trade Secret Registry; NTP = National Toxicology Program; OEL = Occupational Exposure Limit; OSHA = Occupational Safety and Health Administration; PEL = Permissible Exposure Limit; PNOC = Particulates Not Otherwise Classified; PPE = Personal Protective Equipment; PRTR = Designated Chemical Substance Law (Japan); PSD = Short Term Exposure Limit (Indonesia); RCRA = Resource Conservation and Recovery Act; REACH = Registration, Evaluation, Authorisation and Restriction of Chemical Substances; REL = Recommended Exposure Limit; RID = Transport of Dangerous Goods by Rail; SARA = Superfund Amendments and Reauthorization Act; SCBA = Self Contained Breathing Apparatus; SDS = Safety Data Sheet; SEPA = State Environmental Protection Administration; STEL = Short Term Exposure Limit; TDG = Transportation of Dangerous Goods; TLV = Threshold Limit Value; TSCA = Toxic Substances Control Act; TWA = Time Weighted Average; UEL = Upper Explosive Limit; UFL = Upper Flammable Limit; VLA-ED = Valor límite Ambiental de Exposición Diaria (Environmental Exposure Daily Limit Value); VME = valeur limite d'exposition (Occupational Exposure Limits); WHMIS = Workplace Hazardous Materials Information Systems

MSDS Prepared by: NOVA Chemicals

MSDS Information Phone Number: 1-412-490-4063

Other Information

Notice to Reader:

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